

# Blood Flow Restriction Exercises Following an ACL Reconstruction in a 17-Year-Old Female Athlete: A Case Report

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## Background

- Anterior cruciate ligament (ACL) reconstructions account for over 50% of all sports-related knee surgeries.<sup>1</sup>
- Due to graft healing, rehab protocols do not allow for high resistance training for several months.<sup>2</sup>
- Blood flow restriction (BFR) therapy with low load exercise has been suggested to improve quadriceps and hamstring strength and hypertrophy in adults.<sup>3</sup>
- There is currently a lack of research on the effects of BFR therapy on hamstring strength and hypertrophy following an ACL reconstruction in high school athletes.

## Purpose

- The purpose of this case report was to assess how BFR therapy affects hamstring and quadriceps strength and hypertrophy in a 17-year-old athlete following an ACL reconstruction.

## Case Description

- The patient was a 17-year-old female who played lacrosse, field hockey, and basketball and sustained a right ACL tear and semilunar meniscal tear.
- Surgical interventions included an ACL reconstruction using a semitendinosus hamstring graft.
- The patient's initial evaluation showed right knee range of motion (ROM), strength, and hypertrophy deficits as well as balance and gait impairments.
- This patient was seen 2x/week for 9 weeks followed by 1x/week for 3 weeks.
- ROM and strength measures were taken every 4 weeks using goniometry, MMT, and MicroFET2 dynamometry.

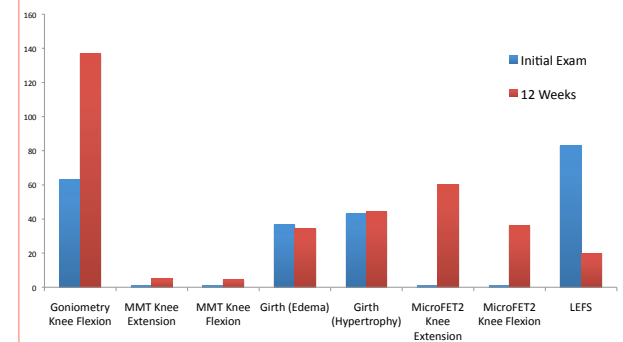
## Interventions

- A blood pressure cuff was inflated to 120mmHg around the right proximal thigh during exercise.
- Exercises were performed for 3 sets of 20-30 repetitions, 2-3 times per day, with 30 second rests between sets.
- The patient was discharged after 18 weeks with a home exercise program (HEP) to continue improvements in order to participate on her high school basketball team.



Figure 1: This shows a blood pressure cuff used for BFR at the proximal thigh.

## Outcomes



- Figure 2: Goniometry (°), MMT (graded 0-5/5), Girth (cm), MicroFET2 Dynamometry (lbs), LEFS (% disabled).

## Discussion

- The results were similar to other BFR therapy studies.
- All outcome measures including LEFS, MMT, MicroFET2, Hypertrophy, and ROM improved.
- Following 12 weeks of PT, the patient was able to run, jump, and squat, as well as return to sport specific training.

## Conclusion

- BFR therapy was an effective treatment for a 17-year-old female athlete following an ACL reconstruction.
- Further research may consider investigating which low load exercises are best in combination with BFR therapy.

## Acknowledgements and References

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